

Mr. Kevin Bilash USEPA Region III Land, Chemicals & Redevelopment Division 3LD20 1650 Arch Street Philadelphia, PA 19103 March 31, 2022 File No. 4862.04

Re: Marcus Hook Industrial Complex
Monthly Progress Report – March 2022
Area of Interest 7
Marcus Hook, PA

Dear Mr. Bilash:

This monthly progress report is being submitted on behalf of the Evergreen Resource Management Operations (Evergreen) for AOI 7 at the Marcus Hook Industrial Complex (MHIC) in Marcus Hook, Pennsylvania. On December 9, 2021, a Revised Interim Measures (IM) Workplan was submitted to the USEPA to address arsenic in the subsurface at AOI 7. The USEPA approved the Revised IM Workplan on February 15, 2022. This monthly progress report is being submitted in accordance with the USEPA's request in the October 26, 2021 correspondence concerning the IM Workplan.

Activities completed this reporting period

The activities that were completed during this reporting period (March 2022) include field mobilization, sediment/porewater sampling and stilling well installation, as described in the Revised IM Workplan, that occurred March 22, 2022 through March 25, 2022.

A summary of the sediment and porewater sampling event is described below:

- Sediment samples were collected for arsenic analysis (30 samples plus one field duplicate, MS and MSD sample) and sulfate/sulfide analysis (four samples).
- Porewater samples were collected via peristaltic pump, diffusive gradient thin film (DGT) samplers and through centrifuge samples for dissolved arsenic analysis.
 - o 11 samples were collected via peristaltic pump (plus one field duplicate sample, the MS and MSD sample were not able to collected due to available volume).
 - o 21 samples were collected via DGT sampler.
 - o 18 samples were collected via centrifuge sample (plus one field duplicate, MS and MSD sample).
- A 2-inch PVC stilling well was installed on Dock 3.

Activities planned for the next reporting period

The activities planned for the next reporting period (April 2022) include the following activities, as described in the Revised IM Workplan:

- Field mobilization
- Drilling and monitoring well installation (for one soil boring and four monitoring wells)
- Soil sampling (39 samples for arsenic and iron, 15 samples for COD/BOD/TOC, 9 samples for grain size, 2 samples for Atterberg limits, and 5 samples for bench scale treatability studies)
- Pressure transducer installation in 10 locations
- Groundwater flow meter installation in up to 10 locations

Surveying of soil borings, monitoring wells, and stilling well

The proposed locations for the proposed boring and monitoring wells are shown in Figure 33 of the Revised IM Workplan, which is attached to this progress report as Figure 1. The field activities listed above are planned for April 4, 2022 through April 8, 2022.

In addition, groundwater sampling for the PDI and bench scale treatability studies, as described in the Revised IM Workplan, is planned for April 18, 2022 through April 19, 2022.

Deviation from approved activities this reporting period

The approved Revised IM Workplan included the collection of an additional sediment sample to be sent to the laboratory for centrifugation to extract porewater from sediment, if the peristaltic pump failed to yield results after two attempts at that location. As discussed with the USEPA on March 17, 2022, the sampling team was to make 2 attempts to collect porewater samples at each location. If a porewater sample could not be collected, the sampling team was to move onto the next location without collecting a centrifuge sample, since the proposed sample density was sufficient enough to allow for multiple locations to be eliminated and still provide sufficient data, unless a significant amount of porewater samples could not be collected.

Based on encountered field conditions, porewater samples could only be collected at 11 of the proposed 30 locations, despite up to 10 attempts at most locations to obtain a sample. These difficulties in sample collection were discussed with the USEPA during the field effort, and as discussed, the team returned to locations to collect additional samples for centrifuge analysis as well as additional DGT samples. The sampling team collected 18 samples to be analyzed via centrifuge analysis and 21 samples via DGT samplers, in addition to the 11 porewater samples.

As the sampling was just completed, a figure illustrating the sample locations and associated sampling methods will be included in the next Monthly Progress Report.

Deviation from approved schedule

The final schedule of IM Workplan activities was updated based on the February 15, 2022 USEPA approval and the availability of subcontractors to complete the planned activities. The schedule for the major milestones is provided below and the detailed schedule is included in Attachment A. There are no anticipated deviations from the approved schedule.

| Task | Schedule |
|----------------------------------|------------------|
| PDI Activities | 3/2022 - 5/2022 |
| Bench Scale Treatability Testing | 4/2022 - 7/2022 |
| Pilot Testing | 7/2022 - 10/2022 |
| IM Performance Monitoring | 9/2022 - 9/2023 |

Very truly yours,

SANBORN, HEAD & ASSOCIATES, INC.

Colleen Costello, PG Senior Vice President

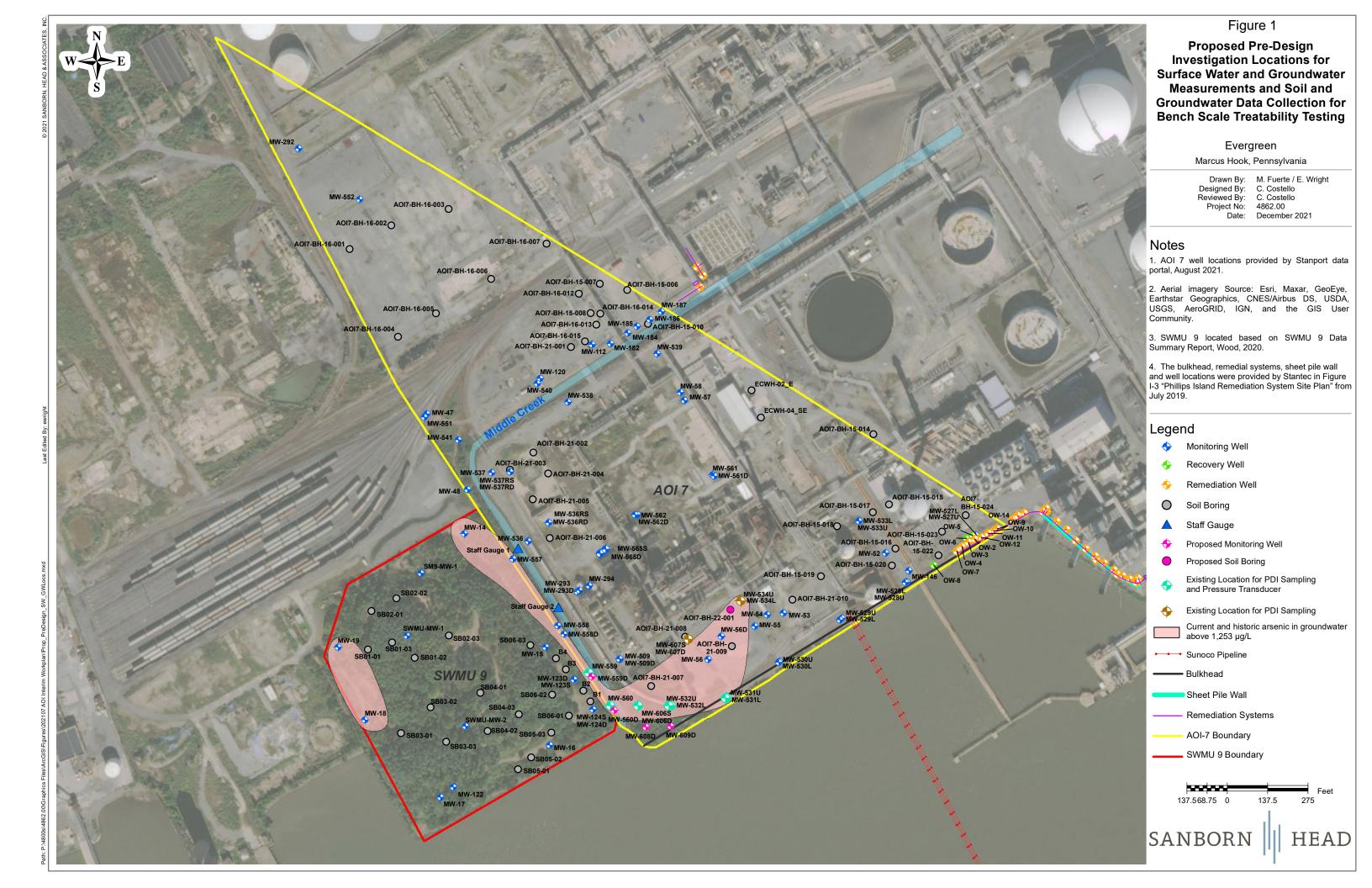
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FIGURES

Figure 33 – Proposed Pre-Design Investigation Locations for Surface Water and Groundwater Measurements and Soil and Groundwater Data Collection for Bench Scale Treatability Testing

ATTACHMENTS

Attachment A – Updated Interim Measures Implementation Schedule



ATTACHMENT A

Updated Interim Measures Implementation Schedule AOI 7 MHIC Marcus Hook, Pennsylvania

| Task Name | Start | Finish | | Q4 | | | Q1 | | | Q2 | | | Q3 | | Q4 | | | Q1 | | | Q2 | | | Q3 | | | Q4 |
|---|----------|----------|-----|-----|----------|-----|-----|-----|-----|-------|-------|-----|---------|-----|-----|-----|-----|-----|-------|-------|-----|-----|-----|-----|-------|-------|---------|
| | | | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May . | Jun J | Jul | Aug Sep | Oct | Nov | Dec | Jan | Feb | Mar / | Apr N | Лау | Jun | Jul | Aug | Sep C | Oct N | Nov Dec |
| Submit IM Workplan to EPA | 12/09/21 | 12/09/21 | | | 5 | | | | | | | | | | | | | | | | | | | | | | |
| EPA Approval of IM Workplan | 12/10/21 | 02/15/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Monthly Report to EPA | 01/31/22 | 07/31/23 | | | | | | | | | | | | | | | | | | | | | | | | | |
| January 2022 Monthly Report | 01/31/22 | 01/31/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| February 2022 Monthly Report | 02/28/22 | 02/28/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| March 2022 Monthly Report | 03/31/22 | 03/31/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| April 2022 Monthly Report | 04/29/22 | 04/29/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| May 2022 Monthly Report | 05/31/22 | 05/31/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| June 2022 Monthly Report | 06/30/22 | 06/30/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| July 2022 Monthly Report | 07/29/22 | 07/29/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| August 2022 Monthly Report | 08/31/22 | 08/31/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| September 2022 Monthly Report | 09/30/22 | 09/30/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| October 2022 Monthly Report | 10/31/22 | 10/31/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| November 2022 Monthly Report | 11/30/22 | 11/30/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| December 2022 Monthly Report | 12/30/22 | 12/30/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| January 2023 Monthly Report | 01/31/23 | 01/31/23 | | | | | | | | | | | | | | | | | | | | | | | | | |
| February 2023 Monthly Report | 02/28/23 | 02/28/23 | | | | | | | | | | | | | | | | | | | | | | | | | |
| March 2023 Monthly Report | 03/31/23 | 03/31/23 | | | | | | | | | | | | | | | | | | | | | | | | | |
| April 2023 Monthly Report | 04/28/23 | 04/28/23 | | | | | | | | | | | | | | | | | | | | | | | | | |
| May 2023 Monthly Report | 05/31/23 | 05/31/23 | | | | | | | | | | | | | | | | | | | | | | | | | |
| June 2023 Monthly Report | 06/30/23 | 06/30/23 | | | | | | | | | | | | | | | | | | | | | | | | | |
| July 2023 Monthly Report | 07/31/23 | 07/31/23 | | | | | | | | | | | | | | | | | | | | | | | | | |
| PDI | 03/07/22 | 05/31/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| PDI Mobilization | 03/22/22 | 05/31/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sediment and Porewater Sampling | 03/22/22 | 05/31/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Field Mobilization | 03/22/22 | 03/22/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Collection of sediment samples and grab porewater samples | 03/22/22 | 03/25/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Collection of DGT porewater samples | 03/22/22 | 03/23/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Laboratory Data Analysis | 03/28/22 | 04/11/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Data Validation | 04/11/22 | 04/25/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Data Evaluation | 04/25/22 | 05/31/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| GW Elevation and GW Flow Evaluation | 04/07/22 | 04/29/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Installation of Transducers/Flow Meter | 04/08/22 | 04/08/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Install stilling well | 04/07/22 | 04/08/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Data Collection | 04/08/22 | 04/27/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Data Evaluation | 04/27/22 | 04/29/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Monitoring Well Installations, Soil Borings and Soil Sampling | 03/07/22 | 05/31/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Obtain Access to Honeywell Property | 03/07/22 | 04/01/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Delaware Well Permits | 03/21/22 | 04/01/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Utility Clearance | 03/25/22 | 03/25/22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Soil Borings, Well Installations and Soil Sampling | 04/04/22 | 04/08/22 | | | | | | - | | | | | | | | | | | | | | | | | | | |

| Laboratory Data Analysis 04/11/22 Data Validation 04/25/22 Well Development 04/07/22 Well and Boring Survey 04/18/22 Data Evaluation 05/06/22 Groundwater Sampling 04/18/22 Groundwater Sampling 04/18/22 Laboratory Data Analysis 04/19/22 Data Validation 05/03/22 Data Evaluation 05/16/22 | 04/25/22 05/06/22 04/08/22 04/18/22 05/31/22 05/31/22 04/19/22 05/03/22 05/16/22 05/31/22 | Oct | Nov D | ec Ja | lan Fe | eb Mar | Apr | May J | un Jul | Aug | Sep | Oct | Nov | Dec Ja | n Feb | Mar Apr | May | Jun | Jul | Aug So | ep Oct | Nov Dec |
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| Data Validation 04/25/22 Well Development 04/07/22 Well and Boring Survey 04/18/22 Data Evaluation 05/06/22 Groundwater Sampling 04/18/22 Groundwater Sampling 04/18/22 Laboratory Data Analysis 04/19/22 Data Validation 05/03/22 Data Evaluation 05/16/22 | 05/06/22 04/08/22 04/18/22 05/31/22 05/31/22 04/19/22 05/03/22 05/16/22 05/31/22 | | | | | | | | | | | | | | | | | | | | | |
| Well Development 04/07/22 Well and Boring Survey 04/18/22 Data Evaluation 05/06/22 Groundwater Sampling 04/18/22 Groundwater Sampling 04/18/22 Laboratory Data Analysis 04/19/22 Data Validation 05/03/22 Data Evaluation 05/16/22 | 04/08/22 04/18/22 05/31/22 05/31/22 04/19/22 05/03/22 05/16/22 05/31/22 | | | | | | | | | | | | | | | | | | | | | |
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| Data Evaluation 05/06/22 Groundwater Sampling 04/18/22 Groundwater Sampling 04/18/22 Laboratory Data Analysis 04/19/22 Data Validation 05/03/22 Data Evaluation 05/16/22 | 05/31/22 05/31/22 04/19/22 05/03/22 05/16/22 05/31/22 | | | | | | | | | | | | | | | | | | | | | |
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| Groundwater Sampling 04/18/22 Laboratory Data Analysis 04/19/22 Data Validation 05/03/22 Data Evaluation 05/16/22 | 04/19/22 05/03/22 05/16/22 05/31/22 | | | | | | | | | | | | | | | | | | | | | |
| Laboratory Data Analysis 04/19/22 Data Validation 05/03/22 Data Evaluation 05/16/22 | 05/03/22 05/16/22 05/31/22 | | | | | | | | | | | | | | | | | | | | | |
| Data Validation 05/03/22 Data Evaluation 05/16/22 | 05/16/22 05/31/22 | | | | | | | | | | | | | | | | | | | | | |
| Data Evaluation 05/16/22 | 05/31/22 | | | | | | | | | | | | | | | | | | | | | |
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| Bench Scale Treatability Test 04/19/22 | 07/22/22 | | | | | | | | | | | | | | | | | | | | | |
| Baseline Characterization 04/19/22 | 05/02/22 | | | | | | | | | | | | | | | | | | | | | |
| ■ Titration and Soil Oxidant Demand Test 05/02/22 | 05/06/22 | | | | | | | | | | | | | | | | | | | | | |
| Titration 05/02/22 | 05/02/22 | | | | | | | | | | | | | | | | | | | | | |
| Soil Oxidant Demand Test 05/02/22 | 05/06/22 | | | | | | | | | | | | | | | | | | | | | |
| Reagent Screening 05/09/22 | 06/03/22 | | | | | | | | | | | | | | | | | | | | | |
| Test Setup 05/09/22 | 05/10/22 | | | | | | | | | | | | | | | | | | | | | |
| Initial Test 05/11/22 | 05/13/22 | | | | | | | | | | | | | | | | | | | | | |
| Modification Test (If Needed) 05/16/22 | 05/27/22 | | | | | | | | | | | | | | | | | | | | | |
| Evaluation 05/30/22 | 06/03/22 | | | | | | | | | | | | | | | | | | | | | |
| Rebound Test 06/06/22 | 07/08/22 | | | | | | | | | | | | | | | | | | | | | |
| Reactor Setup 06/06/22 | 06/06/22 | | | | | | | | | | | | | | | | | | | | | |
| First Sampling and Replenishing 06/13/22 | 06/13/22 | | | | | | | | | | | | | | | | | | | | | |
| Second Sampling and Replenishing 06/20/22 | 06/20/22 | | | | | | | | | | | | | | | | | | | | | |
| Final Sampling 06/27/22 | 06/27/22 | | | | | | | | | | | | | | | | | | | | | |
| Evaluation 06/27/22 | 07/08/22 | | | | | | | | - | | | | | | | | | | | | | |
| Bench-scale Study Report 07/11/22 | 07/22/22 | | | | | | | | | | | | | | | | | | | | | |
| ■ Pilot Test 07/25/22 | 08/30/23 | | | | | | | | | | | | | | | | | | | | | |
| Pilot Study Design 07/25/22 | 08/15/22 | | | | | | | | | | | | | | | | | | | | | |
| Pilot Study Implementation 08/16/22 | 10/10/22 | | | | | | | | | | | | | | | | | | | | | |
| Permit 08/16/22 | 09/05/22 | | | | | | | | | 1 | | | | | | | | | | | | |
| Injection Preparation 09/06/22 | 09/19/22 | | | | | | | | | | <u> </u> | | | | | | | | | | | |
| Injection Activities 09/20/22 | 10/10/22 | | | | | | | | | | | | | | | | | | | | | |
| Pilot Study Monitoring 09/20/22 | 08/30/23 | | | | | | | | | | | | | | | | | | | | | |
| Baseline Sampling 09/20/22 | 09/22/22 | | | | | | | | | | | | | | | | | | | | | |
| First Performance Monitoring 11/28/22 | 11/30/22 | | | | | | | | | | | | | | | | | | | | | |
| Second Performance Monitoring 02/28/23 | 03/02/23 | | | | | | | | | | | | | | | | | | | | | |
| Third Performance Monitoring 05/29/23 | 05/31/23 | | | | | | | | | | | | | | | | | | | | | |
| Fourth Performance Monitoring 08/28/23 | 08/30/23 | | | | | | | | | | | | | | | | | | | | | |
| - CMS 09/04/23 | 10/09/23 | | | | | | | | | | | | | | | | | | | | | |
| Design of Final Remedy 09/04/23 | 10/06/23 | | | | | | | | | | | | | | | | | | | | | |
| Submittal of CMS 10/09/23 | 10/09/23 | | | | | | | | | | | | | | | | | | | | | |